

CLAIMS

1. A bump inspection apparatus for inspecting shapes of a plurality of bumps each having a planar top portion, on an inspection object, comprising:

5 an illumination optical system for illuminating said top portions with a parallel pencil of light vertical thereto through a telecentric optical system;

10 an observation optical system comprising a telecentric optical system having an optical axis thereof in conformity with that of said illumination optical system;

15 an observation portion for observing the images of said top portions in a predetermined range of said inspection object through said observation optical system; and

20 a processor unit for analyzing the shapes of said bumps on the basis of the images of said top portions from said observation portion;

25 said processor unit including analyzing means for analyzing the area of said planar top portion of each of said bumps, and judging means for judging whether or not the area of said top portion falls within a predetermined range.

25 2. A bump inspection apparatus according to claim 1, wherein said top portions of all of said bumps of said inspection object exist on the same plane.

30 3. A bump inspection apparatus according to claim 2, wherein said bumps are formed into a substantially hemispherical shape by reflowing of solder, and said top portions of said bumps are shaped into a planar shape by a coining process.

35 4. A bump inspection method for inspecting shapes of a plurality of bumps each having a planar top portion, on an inspection object, comprising the steps of:

an illumination step of illuminating said top portions with a vertical parallel pencil of light

vertical thereto through a telecentric optical system;
an observation step of observing by a telecentric optical system having an optical axis in conformity with that of said illumination optical system;

5 another observation step of observing the images of said top portions within a predetermined range of said inspection object through said observation optical system; and

10 a processing step of analyzing the shapes of said bumps on the basis of the images of said top portions by said observation portion;

15 said processing step including an analyzing stage of analyzing the areas of said planar top portions for said individual bumps and a judging stage of judging whether or not the areas of said top portions are within a predetermined range.

5. A bump inspection method according to claim 4, wherein said top portions of all of said bumps of said inspection object exist on the same plane.

20 6. A bump inspection method according to claim 5, wherein said bump is shaped into a substantially hemispherical shape by reflowing of solder, and said top portion is shaped into a planar shape by a coining processing.